BY ORDER OF THE COMMANDER
AIR FORCE SPACE COMMAND

AIR FORCE SPACE COMMAND
INSTRUCTION 11-202

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Flying Operations

HELICOPTER ROPE SUSPENSION OPERATIONS

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements AFPD11-2, Aircraft Rules and Procedures. It provides guidance to unit commanders concerning techniques, procedures, equipment, methods and safety involved in conducting helicopter rope suspension (HRS) operations. It establishes and defines the chain of operational authority as it applies to HRS operations. It defines qualification, certification, re-qualification and re-certification as they apply to individual Air Force ropers and masters. Lastly, it delineates responsibilities among HRS personnel regarding installation, manipulation and maintenance of HRS equipment and towards aircrew members in conjunction with mission coordination and operational authority. It does not apply to the Air Force Reserve (AFRES) nor Air National Guard (ANG) units.

SUMMARY OF REVISIONS

The revision of this publication is to meet the format standards required by Air Force. No content material has changed. Some required format changes have been made to allow for the conversion process.

Chapter 1

INTRODUCTION

1.1. General. Current Air Force means of helicopter insertion and extraction include helo-rappelling, fast roping and rope ladder. We refer to these methods collectively as helicopter rope suspension operations.Air Force Space Command (AFSPC) uses these insertion/extraction techniques in various ways. These methods are employed by AFSPC medical technicians, security police and explosive ordnance disposal teams for both training and operational scenarios.

1.2. Classification Standards. AFSPC helicopters may conduct airborne insertion and extraction operations using rappelling and fast rope only under the supervision of qualified and certified masters to ensure thorough training and active safety. Each chapter in this instruction sets forth minimum qualification and re-qualification standards for masters and students. Individuals who qualify to conduct and supervise the collective Helicopter Rope Suspension (HRS) methods may be designated HRS masters. Flight engineers may be qualified as Helicopter Rope Suspension Training (HRST) masters; however, performing both flight engineer and master duties simultaneously may be task saturating and is not authorized. AFSPC recognizes Air Force Pararescue personnel and sister service rope qualifications as well. Those standards, in addition to the terms certification and re-certification, are defined as follows:

NOTE:

The following information relating to qualification/certification or re-qualification/re-certification refers to the HRST master only and not aircrew.

1.3. Qualification. Advanced level qualification is attained through instruction at either an AFSPC-approved formal school or equivalent command approved course.

1.3.1. The AFSPC formal school for an HRST Master and re-qualifying as an HRST Master, are listed in AFI36-2223 USAF Formal Schools Chapter 9. Course numbers AFSPCHRST1 (Initial Qual) and AFPSCHRST2 (Re-Certification) are the qualifying courses. Any questions should be directed to HQ AFSPC/DP at DSN 692-3026.

1.4. Certification. Unit commanders delegate the authority to qualified supervisory personnel to conduct initial, advanced and re-qualification training and operations. Certification is not authority from the formal school. Individuals certified as masters in any of the helicopter insert/extract techniques should be experienced in their specific insertion and extraction methods, and must have completed an AFSPC-recognized qualification course.

1.4.1. The waiver authority for this instruction is HQ AFSPC/DOOH.

1.5. Re-qualification. This is training conducted to ensure continued competence in basic or advanced skills. It is based upon a specific time period. A rope master must re-qualify every 18 months. The qualification expires on the last day of the 18th month following the previous qualification. Once this specific period has lapsed, the individual must undergo re-qualification training. Re-qualification may coincide with re-certification.

1.6. Re-certification. This is a periodic confirmation by a unit commander authorizing qualified supervisory personnel to conduct initial, advanced and re-qualification training and operations. Individual commanders may establish unit re-certification standards based upon many factors, such as overall experience, current training and operational experience. Re-certification may coincide with re-qualification standards.

1.7. Operational Authority. To ensure the highest degree of operational safety, a definite channel of authority must exist during all HRS evolutions. The individuals within this channel of authority are the Aircraft Commander (AC), the Flight Engineer (FE) and the rope master. Further discussion will delineate the scope and range of their individual authority.

1.7.1. In all situations, the AC has full responsibility for the safety of the crew , passengers and the orderly conduct of the flight. Likewise, the AC carries overall responsibility for the safe conduct of HRS operations. The AC exercises final authority to cease or terminate operations.

1.7.2. The FE bears responsibility for the safe conduct of all passengers. The FE is responsible for the proper configuration of the aircraft required to conduct HRS operations.

1.7.3. The master is responsible for the safety, conduct and performance of helicopter rope suspension personnel. A rope master, showing a lack of proficiency, may be relieved by a rope master of senior grade, the FE or the AC. Any current rope master present for the evolution may assume the duties and responsibilities of the relieved rope master or may immediately terminate the evolution. If no rope master is present following the relief, the FE will immediately terminate the evolution.

1.7.3.1. During helicopter operations, the master is subordinate in authority to the FE and the AC.

1.8. Equipment and Terminology:

1.8.1. Section. This section provides general information on equipment and terminology peculiar to HRS operations. Information is limited to a brief description and national stock number (NSN).

1.8.2. Ground Equipment. The following equipment is maintained and provided by the ground unit conducting HRS operations.

1.8.2.1. Rappel Rope:

1.8.2.1.1. Military Green/White Line:

1.8.2.1.1.1. NSN: 4020-00-931-8792.

1.8.2.1.1.2. Structure: Nylon, three-stranded, right-hand lay.

1.8.2.1.1.3. Diameter: 7/16-inch.

1.8.2.1.1.4. Length: 120 feet.

1.8.2.1.1.5. Dry tensile strength: 3,840 pounds.

1.8.2.1.1.6. Stretch factor: 33 percent.

1.8.2.1.2. Military Gold Line:

1.8.2.1.2.1. NSN: 4020-00-931-8793.

1.8.2.1.2.2. Structure: Nylon, three-stranded, right-hand lay.

1.8.2.1.2.3. Diameter: 7/16-inch.

1.8.2.1.2.4. Length: 120 feet.

1.8.2.1.2.5. Dry tensile strength: 6,200 pounds.

1.8.2.1.2.6. Stretch factor: 33 percent.

1.8.2.1.3. Static Kernmantle Rope:

1.8.2.1.3.1. NSN: GSA contract #GS07f14181.

1.8.2.1.3.2. Structure: A high-strength inner core covered by an outer woven sheath.

1.8.2.1.3.3. Diameter: 11mm.

1.8.2.1.3.4. Length: Commonly 150 feet; available up to a 600-foot spool.

1.8.2.1.3.5. Dry tensile strength: 6,800 pounds

1.8.2.1.3.6. Color: Olive drab/black.

1.8.2.2. Pli-moorr Fast Rope:

1.8.2.2.1. NSN: 60-foot length: 4020-01-352-2728.

1.8.2.2.2. NSN: 90-foot length: 4020-01-352-2729.

1.8.2.2.3. NSN: 120-foot length: 4020-01-352-2730.

1.8.2.2.4. Structure: Eight strand Pli-moorr firm lay synthetic line, with high-tech termination hardware and safety cable.

1.8.2.2.5. Diameter: Fast rope-1 3/4-inch Safety cable-1/8-inch.

1.8.2.2.6. Dry tensile strength: 35,000 pounds.

1.8.2.2.7. Steel safety cable ultimate load : 1,200 pounds.

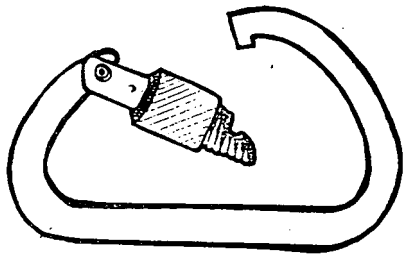
1.8.2.3. Stubai (Locking) Carabiners (See Figure 1.1.):

1.8.2.3.1. Part#: AC0210-02 NSN: 4240-01-192-6272.

1.8.2.3.2. Structure: A steel, modified D-shaped, locking carabiner snaplink.

1.8.2.3.3. Tensile strength: 17,300 pounds.

Figure 1.1. "D" Shaped Locking Carabiner.



1.8.2.4. Leather Gloves:

1.8.2.4.1. NSN: 8415-00-634-4660.

1.8.2.4.2. Description: Heavy-duty, leather work gloves.

1.8.2.5. Goggles:

1.8.2.5.1. NSN: 8465-01-004-2893.

1.8.2.5.2. Description: Military; impact plastic with elastic head strap.

1.8.2.6. Rope Storage/Deployment Bag:

1.8.2.6.1. NSN: 1670-00-590-9909.

1.8.2.6.2. Description: Standard military parachute D-bag.

1.8.2.7. Nylon Rope Ladder (Randon Tech MFG, Scottsdale AZ).

1.8.2.7.1. Part # : ELD800PD-1; Structure: Two 35-foot nylon straps, joined by 16-inch long rungs and attached at the top by a nylon suspension system. The rungs are 12 inches apart.

1.8.3. Terminology. The following terms are peculiar to helicopter-rope suspension training and operations.

1.8.3.1. Running End: the free or working end of a rope.

1.8.3.2. Loop: a bend in a rope in which the line crosses itself.

1.8.3.3. Round Turn: wrapping the rope around a specific object such as a post, rail or pipe so the running end leaves the circle in the same direction as the standing end.

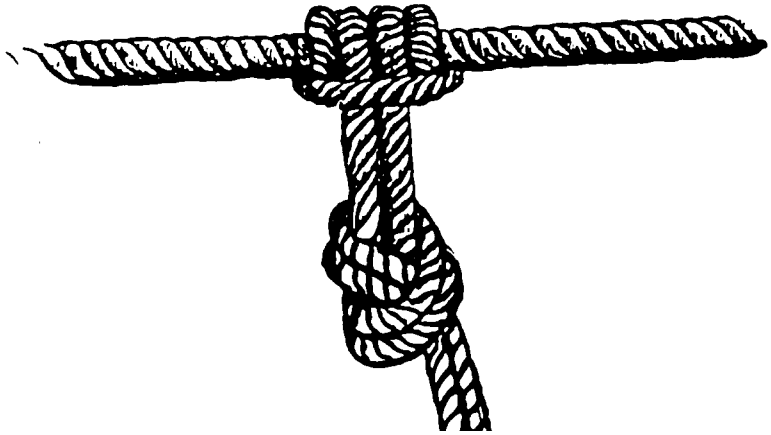
1.8.3.4. Bight: a bend or U-shaped curve in a rope in which the line does not cross itself.

1.8.3.5. Standing End: (a) the end of a rope secured to an anchor point and (b) the static end of a rope.

1.8.3.6. Belay/Brake: a method to control or stop the uncontrolled descent of a roper by friction.

1.8.3.6.1. Prusik Knot (**Figure 1.2.**): this knot is used to put a moveable rope on a fixed rope of different diameter. This knot maintains 70 percent to 75 percent of the rope's tensile strength and is used primarily as a safety for a rappeller who is not afforded a belay. If the rappeller were to lose their brake or "fall," the prusik knot will act as a brake until the roper regains control.

Figure 1.2. Prusik Knot.



1.8.3.7. Fast Rope: (a) an HRS technique used to quickly insert personnel and (b) a special braided rope used in fast rope operations.

1.8.3.8. Figure 8 Assault Descender: a metal alloy device roughly resembling the numeral 8 in structure, used for rappelling with heavy loads.

1.8.3.9. Rope Ladder: (a) an HRS technique well-suited for extracting personnel from land, water, small boats, barges, etc. and (b) two nylon lines connected by aluminum rungs used in rope ladder operations.

1.8.3.10. Line: in rappelling, a 7/16-inch-diameter rope (11 mm).

1.8.3.11. Monkey Ball: a method of rolling a rappelling line onto itself so it readily deploys without entanglement when dropped from a helicopter or tower.

1.8.3.12. Rope Station: (a) the point on a static tower or helicopter where a person executes a descent and (b) the area(s) on a static tower or helicopter where ropes are rigged for HRS training and operations.

1.8.3.13. Sling Rope: a 12- to 15-foot length of 7/16-inch rappel line, whipped and burned on both ends; used to construct rappel seats and safety lines.

1.8.3.14. Snaplink: a D-shaped steel ring with a spring tension gate which may or may not be configured with a threaded, screw-top locking gate. It is also called a Carabiner or Stubai.

1.8.3.15. Opposing Snaplinks: The placement of two non-locking snaplinks on an attachment point (rope, cargo tiedown ring, etc.) so the gates open in different directions to prevent inadvertent release from the attachment point.

1.8.3.16. Stick: a number of individuals exiting an aircraft in rapid succession.

1.8.3.17. Whipping: wrapping or binding light cord around the end of a line to prevent it from unraveling.

1.8.4. Training Insertion/Extraction. For the purpose of this instruction, a training insertion/extraction is a training evolution conducted for the purpose of mastering the insertion/extraction technique.

1.8.5. Operational/Extraction. Operational insertions/extractions should not be performed until individuals have mastered the insertion/extraction technique.

1.9. Training:

1.9.1. Minimum requirements to conduct HRS operations. The following requirements are mandatory in all instances where personnel insert/extract by helicopter.

1.9.1.1. Internal Communication System (ICS). A positive ICS over interphone must be maintained throughout any insertion/extraction evolution between all aircrew members including the master. While alternate signals must be established, their use should be limited to emergency situations.

1.9.1.2. Mission Briefs. The master must conduct an operation brief for all insertion/extraction personnel and a face-to-face mission brief for all aircrew personnel participating in the insertion/extraction operation. The brief must include a discussion of emergency procedures.

1.10. Safety:

1.10.1. Lack of knowledge, poor training, equipment failure and improper rigging can create a dangerous situation. Safety must be the primary concern during training exercises. Training should ensure that individuals develop confidence in themselves and their equipment. Safety can only be effective if it is actively applied. Safety must not be sacrificed for training realism.

1.10.2. The procedures contained throughout this publication are, by design, the absolute minimum requirements to ensure safety. In cases not covered by these procedures, sound judgment and common sense must prevail to ensure the safety of all concerned. Aside from reliable equipment and procedures training, many outside factors influence the safe conduct of operations.

1.10.3. Environmental Factors. Environmental factors may affect the pilot's ability to safely position the helicopter and maintain that position over the target area. Also, the affects of altitude, temperature, wind and humidity affect aircraft performance.

1.10.4. Care must be taken to select a drop/pickup zone that is relatively free of dust, snow or other objects that could obscure the pilots vision.

1.10.5. Visibility Factors. Night or limited visibility operations further affect the master's ability to maintain control of personnel during the evolution.

1.10.5.1. Night operations may be conducted with or without night vision goggles (NVGs) as long as the pilot can maintain a steady position over the target area and all other qualifications and conditions are met.

1.10.5.2. During night training (unaided or aided), the master should use chem-lights to determine rope and personnel positions. Using a finger light or a chem-light provides a reference for the master to hook up each roper. A chem-light on each individual's left arm and one on their right leg provides the master and/or belayer a reference of the person's position during the evolution. Chem-lights can also assist with hand-and-arm signals during night operations. It is imperative that the FE be able to see the rope in contact with the ground at all times after it is deployed.

WARNING: Chem-lights will not be attached to rappel lines during night operations.

1.10.6. Load Factors. Applying loads to ropes, rigging and aircraft airframes must be closely monitored to ensure safe operations. Overloading can result in injury to personnel, structural damage to aircraft and failure of equipment. The ultimate load and limit load are designed into the equipment by

the manufacturer. These values must be known before any loading operations are attempted. Several factors combine to produce total load. These factors are:

1.10.6.1. Applied Load (AL). The total weight (in pounds) suspended from an anchor point is the applied load. The AL includes the weight of the individual with their equipment, the rope and rigging.

1.10.6.2. Limit Load (LL). The total weight (in pounds) which any structure can bear before experiencing structural yielding is the limit load. The AL must never exceed one-half of the limit load. The LL safety factor shall always be twice the applied load.

1.10.6.3. Load Formula (Maximum AL). At no time shall the total load (TL) exceed one-half the load limits of equipment, anchor points or airframe load limitations. This total load equation is a formula to use to compute the total weight applied during rappel.

1.10.6.4. Maximum AL = 1/2 LL.

1.10.6.5. Ultimate Load (UL). The UL is the weight (in pounds) at which a structure will fail. The UL safety factor shall always be one and one-half the LL.

1.10.7. Flight Dynamics:

1.10.7.1. Rotor Downwash. Rotor downwash causes sand and small objects to be blown in the infiltration/exfiltration zone. Approved eye protection is required for all deployed personnel. In addition, any uniform which fully covers the roper's arms and legs is recommended to avoid cuts, abrasions and skin irritations.

1.10.7.2. Hover Height. Numerous factors determine suitable hover heights and, therefore, preclude establishment of a prescribed altitude for helicopter operations.

1.10.7.2.1. A rope hanging beneath the helicopter can become agitated by rotor downwash and could present a potentially dangerous situation by the rope flailing about. Hover height should be adjusted to reduce the affects of this phenomenon. A slightly higher hover reduces the affect of rotor downwash on the ground and rope.

1.10.7.2.2. While operating in wooded or mountainous areas, hover height is restricted to the lowest possible height commensurate with rope length, obstacle clearance, visual cues, soil stability, rotor downwash and helicopter performance.

1.10.7.3. Static Discharge. Static electricity is generated by a helicopter's rotors disturbing the air. It is discharged from the aircraft by contact with the ground.

1.10.7.3.1. Dry Conditions. Ropes are non-conductive and do not allow static electricity to be discharged through them. "The deployed personnel may experience a slight shock upon touching the ground." The shock could be masked by other sensations associated with the evolution.

1.10.7.3.2. Wet Conditions. Ropes may become conductive if wet. Conductivity lessens as the length of the rope increases.

1.10.8. Inner Aircraft Safety. The following recommendation enhances the safety inside the aircraft:

1.10.8.1. Hand Holds. When possible, improvise hand holds to assist in moving from a seated position to rope stations. Cargo straps, ropes or webbing can be secured overhead to provide a secure hand hold during movement.

1.10.9. Loose Gear. Loose gear or equipment inside the helicopter will be secured at all times.

1.10.10. Rope Stations:

1.10.10.1. A qualified master will monitor each rope station to ensure positive control (except for rope ladder stations).

1.11. Mishap Procedures:

1.11.1. If a mishap occurs, all training will cease. Follow local procedures. Do not disturb the rope rigging if it was a factor in the mishap, unless it interferes with the evacuation of the injured personnel.

1.12. Submit changes for this instruction through HQ AFSPC/DOOH.

Chapter 2

HELICOPTER RAPPELLING

2.1. General. Helicopter rappelling is a means of descending from a hovering helicopter by sliding down a rope passed through or across a friction device which slows the descent. In mountainous terrain, helicopter rappelling techniques are employed to move equipment and personnel to terrain unsuitable for aircraft landing. This technique is also useful in urban environments.

2.2. Chapter. This chapter establishes the basic guidelines for employing helicopter rappelling techniques.

2.3. Personnel:

2.3.1. To ensure safe rappelling operations, individuals are certified as rappel masters. In addition to serving as actual rappel masters, qualified individuals may also serve as assistant rappel masters.

2.3.2. Duties. The rope master is responsible for administering an operation brief and applicable aircrew brief, inspecting and rigging the aircraft, deploying rappel lines, hooking up and launching rappellers and recovering rappel lines. Only one rope master may control a rappelling evolution, but the master may be assisted in his/her duties by any number of assistant rappel masters or the FE for airborne operations.

2.4. Equipment:

2.4.1. During training, pad the entire bottom edge of the cargo door where a rope will be. Use appropriate material (i.e., two thickness' of 1/2-inch hair felt pads, carpet or other suitable material) to ensure that all sharp edges are padded and not merely taped over. The padding may be taped to the or tied to the cabin floor utilizing cargo tie-down rings.

2.4.2. Where possible, the padding extends from the edges of the opening at least four inches toward the anchor point and four inches back. Pad around the bottom edges and away from the edge on the outside of the aircraft.

2.4.3. When padding is used, secure it so it cannot be inadvertently displaced.

2.4.4. All surfaces must be clean and free of oil and solvents.

2.4.5. Anchor Points and Rigging. Helicopter operations are conducted with a redundancy of safety backup ropes and anchor points.

2.4.6. All aircraft rappel rigging employs three anchor points.

2.4.7. Rappel rigging configurations must ensure even distribution of load among all three anchor points.

2.4.8. Rappel training may be conducted using one or two rappel lines on the same rig.

2.4.9. When rigging an aircraft, a master may replace any locking snaplink with two opposing, non-locking, snaplinks. (See**Figure 2.2.**)

2.5. Rope Management. Since the rappel line is the rappeller's lifeline, it requires and deserves a great deal of respect and attention. Simple maintenance procedures ensure that it is serviceable and safe.

2.5.1. New Rappel Lines:

2.5.1.1. Remove a new rappel line from the shipping container and visually inspect it for any signs of damage or obvious defects. After visual inspection, whip, burn or rubber coat both ends of the rappel line to prevent unraveling.

2.5.1.2. Next, secure one end of the rappel line to a cylindrical anchor point, such as a telephone pole, tree, post, etc. Extend it to its full length. Have other individuals pick up the running end of the rappel line and pull it taut. While the rappel line is under tension, visually and physically inspect it again for any signs of damage or defects. If, after the inspection, there are no signs of damage or weakness, the rappel line may be considered safe for use.

2.5.1.3. Mark the rappel line for identification. Both ends of the rappel lines should be color coded. Never use paint to mark rappel lines.

2.5.1.4. Old/Used Rappel Lines. Old/used rappel lines should be checked before and after every use for excessive wear, cuts, frays, burns and mildew or rotten spots.

2.5.1.5. Inspection. The rappel master will inspect each rappel line before accepting it for use and prior to its return. Normal reporting procedures for defective rappel lines are used.

2.5.1.6. Care and Maintenance:

2.5.1.6.1. If at all possible, keep the rappel line dry. The rappel line loses approximately 18 percent of its tensile strength when wet. This percentage of tensile strength loss could increase with older/used rappel lines. If rappel lines become wet, dry them as soon as possible by uncoiling them and laying them in a dry, well-ventilated area. If possible, suspend them above the ground to reduce drying time. Never store a wet or damp rappel line.

2.5.1.6.2. If a rappel line comes in contact with salt water, the rappel line must be down-graded to a Grade III status (see **Table 2.1.**). Rappel lines exposed to salt water must be rinsed in fresh water before drying.

2.5.1.6.3. If any part of the rappel line comes in contact with oil, gas, solvents or other types of petroleum-based solvents, it is immediately considered unserviceable. Avoid excessive heat. Do not lay rappel lines in direct sun-light when drying as this weakens them.

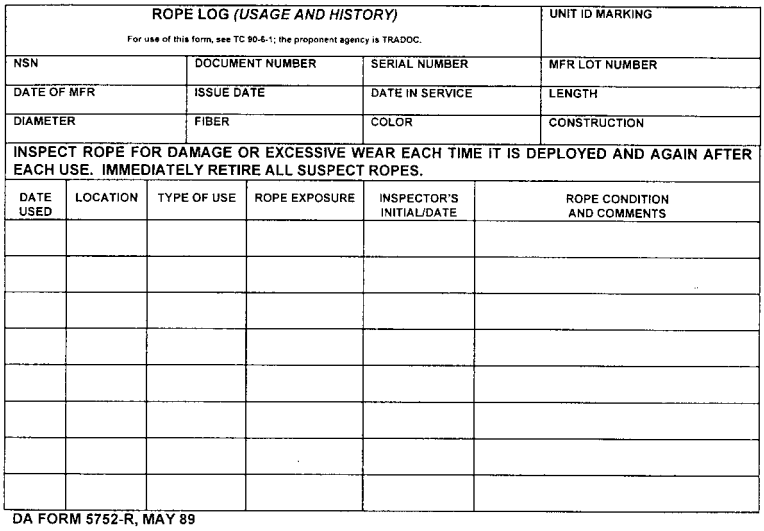
2.5.1.6.4. Never splice rappel lines.

2.5.1.6.5. Never keep rappel lines knotted or stretched any longer than necessary. Never stand, walk or step on a rappel line. This can force sand or dirt into the strands which fray and weaken the rope. If the rappel line becomes dirty, shake it clean or rinse it with fresh water and lay it out to dry before storing.

2.5.1.7. Unserviceability. Any rappel line considered unserviceable must be separated from use-able rappel lines and tagged with the nature of the defect, the date and the name of the inspector.

2.5.1.8. Record Keeping (**Figure 2.1.**). A rope log will be maintained on all ropes. See suggested example format below.

Figure 2.1. Example Rope Log Format.



ROPE LOG *(USAGE AND HISTORY)* For use of this form, see TC 90-6-1; the proponent agency is TRADOC.			UNIT ID MARKING
NSN	DOCUMENT NUMBER	SERIAL NUMBER	MFR LOT NUMBER
DATE OF MFR	ISSUE DATE	DATE IN SERVICE	LENGTH
DIAMETER	FIBER	COLOR	CONSTRUCTION

INSPECT ROPE FOR DAMAGE OR EXCESSIVE WEAR EACH TIME IT IS DEPLOYED AND AGAIN AFTER EACH USE. IMMEDIATELY RETIRE ALL SUSPECT ROPES.

DATE USED	LOCATION	TYPE OF USE	ROPE EXPOSURE	INSPECTOR'S INITIAL/DATE	ROPE CONDITION AND COMMENTS

DA FORM 5752-R, MAY 89

2.5.1.9. Rope Grading. **Table 2.1.** is a general guide establishing maximum limits on rope use. A rappel master, however, may downgrade rope at any time if, in their opinion, there is doubt about the serviceability of a rope.

Table 2.1. Rope Grading Table.

Grade	Definition	Appearance	Use
I	A new rappel line but not older than two years or with no more than 300 rappels on it.	Little or no external wear.	High rappelling tower/Helo-rappel.
II	A rappel line older than two years or with more than 300, but less than 600 rappels on it.	Shows slight external wear, *furry* on the outer yarns.	Non-helo rappelling/Tower rappel, 30 feet or less.
III	A rappel line with more than 600 rappels on it or one that has been exposed to salt water.	N/A	General Use: Not to include rappelling.

2.5.1.10. Storage. During storage, sharp edges or corners might come in contact with rappel lines. Tape or pad these edges to prevent damage or excessive wear to the rappel line. When stored, rappel lines should be coiled and hung from a rounded peg or cylindrical object.

2.5.2. Individual Equipment. At a minimum, each rappeller must have a sling rope (or an approved rappel seat), one locking snaplink, a pair of rappelling gloves, a sheath knife and a helmet (eye protection for helicopter operations) to participate in all rappel training or operations.

2.5.2.1. Floatation Device. An approved personal floatation device is worn by each participant when conducting helicopter rappelling over water or when the rappel aircraft's route to the infiltration zone passes over water.

2.5.3. Combat Equipment. For all rappelling evolutions, the following special considerations apply to preparing combat equipment.

2.5.3.1. Cartridge belts are unfastened for ease of braking.

2.5.3.2. All excess straps on the rucksack are stowed.

2.5.3.3. Rifles are slung over the shoulder and across the back. The butt of the weapon is up, with the muzzle down, and opposite the brake hand.

2.5.3.4. M-60 machine guns are worn in the same manner as rifles. The feed tray and cover, cocking handle, barrel locking lever and carrying handle should be padded and taped.

2.5.4. Rappel Line Deployment:

2.5.4.1. Deploying rappel line. Rappel lines that are knotted or fouled can increase the time it takes to insert a rappeller. The use of the monkey ball, daisy chain and deployment bags ensures that the lines do not become tangled on deployment. Caution must be exercised when deploying rappel lines to avoid striking personnel on the ground. Under no circumstances is a deployment device attached to the end of the rappel line. The line must be free of obstructions to allow rappellers to leave the rappel line once they are on the ground.

2.5.4.2. Rappel Line Weighting. Attaching a weighted object to the running end of any rappel line is prohibited. A sufficient length of rappel line in contact with the ground can act as a weight to assist in counteracting the affects of rotor downwash. A minimum of 20 feet of rappel line in contact with the ground is recommended.

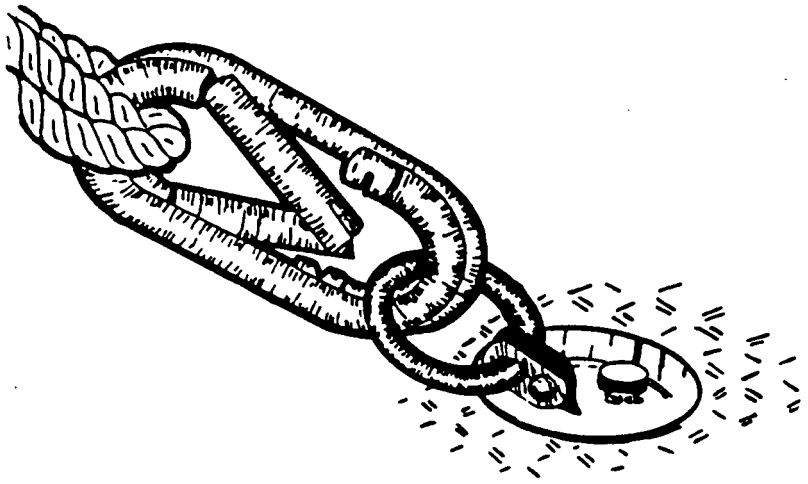
2.6. Aircraft Rigging:

2.6.1. All AFSPC helicopters rig for rappel in the same basic manner. No aircraft modifications are necessary for rappel rigging. There are two stipulations which apply when rigging a helicopter for rappel--each rope station employs three anchor points and adequate padding is required to prevent damaging the rappel lines. The rappel master is responsible for properly rigging the aircraft. He personally conducts a detailed inspection of the aircraft and all rappel rigging.

2.6.2. UH-1N. The UH-1N Huey helicopter can be rigged with one to six rope stations, up to three on each side. The UH-1N rappel system incorporates a total of three anchor points for each rope station.

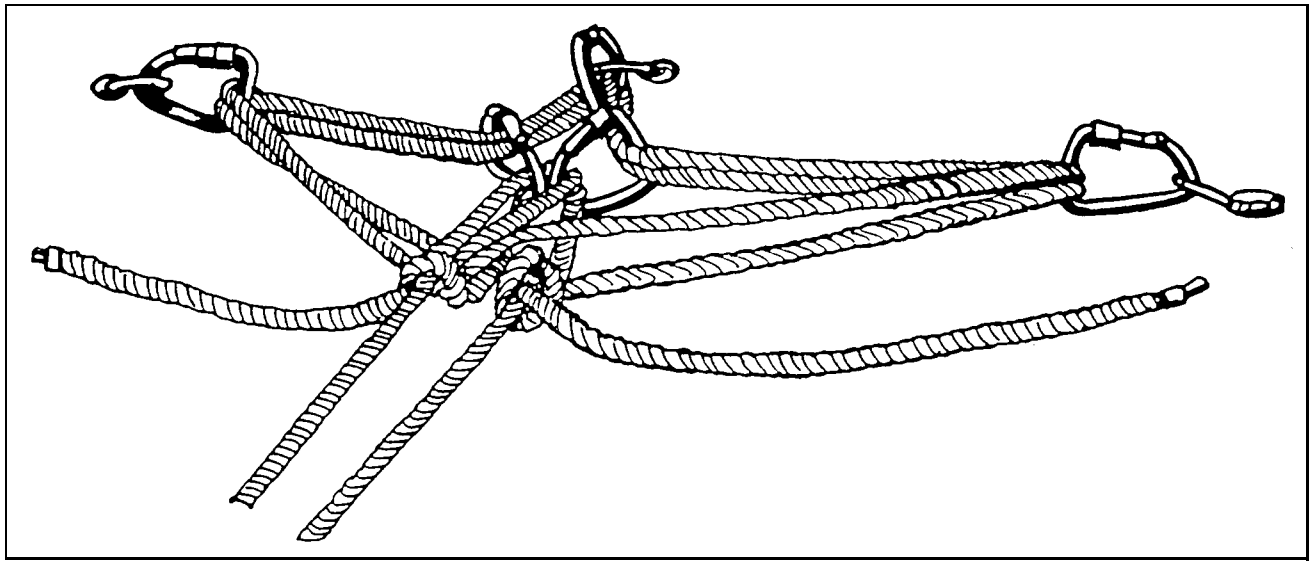
2.6.3. Components and Configuration. Each UH-1N rope station incorporates one or two rappelling ropes and five locking snaplinks (steel are preferred) or five pair of opposing non-locking snaplinks (See **Figure 2.2.**) in a three point, omni-directional, floating self-equalizing assembly. The assembly allows quick installation and removal while maintaining safety. (See **Figure 2.3.**) (NOTE: Depending on the speed and proficiency of the ropers, the rope master may elect to use a double rappel line for slowing rappellers' descents and for added safety.)

Figure 2.2. Opposing, Non-Locking Snaplinks.



2.6.4. Installation. Each rope station uses three cargo tie-down fittings. Since the rigging incorporates an adjustable bowline on a bight knot, the rigging can use any serviceable cargo tiedowns located on the cabin floor.

Figure 2.3. UH-1N Rappel System (Note: Figure Depicts a Dual Rope Installation).



2.6.5. Restrictions. Only one rappeller will be connected to a rappel line at a time.

2.7. Helicopter Rappel Operations:

2.7.1. Safety Personnel:

2.7.1.1. One rope master.

2.7.1.2. One FE.

2.7.2. Safety Equipment:

2.7.2.1. One safety line.

2.7.2.2. One V-blade knife (mandatory).

2.7.3. Sequence of Events. Helicopter rappel procedures follow a standard sequence of events for all types and models of aircraft. The sequence of events follows standard challenge and reply dialogue. The dialogue transpires in three distinct phases; prior to takeoff, inflight and while in a stable hover. (Dialogue is highlighted in bold capital letters.)

2.7.3.1. Prior to Takeoff. Following the operations brief, the aircrew brief and loading personnel aboard the aircraft, the rappel master initiates the standard helo-rappel dialogue:

2.7.3.1.1. STRAP IN. Each rappeller's safety strap and/or seat belt is fastened. The FE checks all seat belts and safety straps.

NOTE:

UH-1N rappelling procedures require that the #1 rappeller on each rope station hook up on the rappel lines prior to strapping in. If each rappeller has their own rappel station, they should be connected to the rappel line at this time. Feet must be inside the cabin (not on the skid) for initial takeoff and landing.

2.7.3.1.2. CHECK EQUIPMENT. Each rappeller checks his/her equipment for loose or obstructive components.

2.7.3.1.3. SOUND OFF FOR EQUIPMENT CHECK. Each rappeller gives their status to the rappel master as OK (or a thumbs up or down if rotors are turning) or states what is fouled with the equipment.

2.7.3.1.4. CLEARED FOR TAKEOFF. The rope master advises the FE when the rappellers are ready for takeoff.

2.7.3.2. In Flight. All rappel participants remain strapped in and follow the directions of the FE. The AC will give 20-, 10-, 5-, and 1-minute out calls, at a minimum.

2.7.3.2.1. FIVE MINUTES. The AC passes this advisory information to the rope master when the aircraft is approximately five minutes from the drop zone. "Once cleared by the AC to open cargo doors, the FE, with assistance from the rope master, opens the cargo doors (if closed) and prepares the rope stations at this time.

2.7.3.2.2. ONE MINUTE. The AC passes this advisory information to the rappel master when the aircraft is approximately one minute from the drop zone. The rappel master moves to his/her rope station with gunner's belt attached.

2.7.3.2.3. GET READY. The rope master gives the rappellers a signal to check themselves one final time and ready equipment.

2.7.3.3. Stable Hover:

2.7.3.3.1. ROPES, ROPES, ROPES. The AC gives the command ropes, ropes, ropes once the aircraft is in a stable hover. During the evolution, the FE will give hover calls, as necessary, to maintain the aircraft over the target area.

2.7.3.3.2. ROPES. The FE gives the command ROPES while simultaneously pointing out the open cargo door(s). At this time the rappellers are authorized to deploy the ropes. Only upon

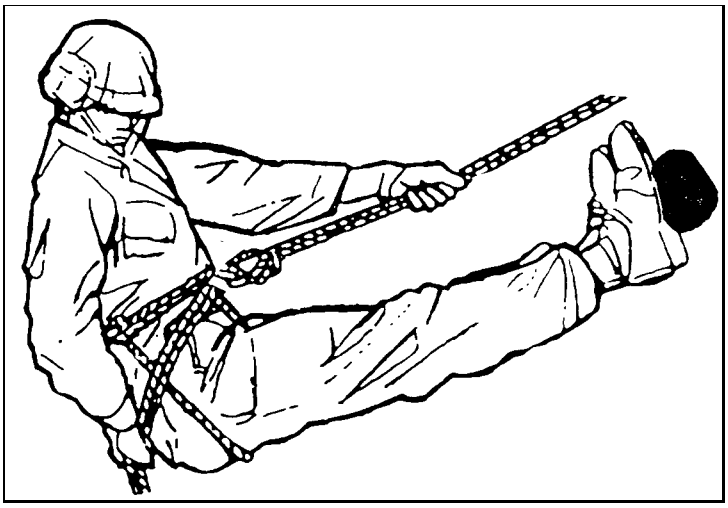
the command ROPES, ROPES, ROPES from the pilot on the controls will the FE give the command ROPES.

2.7.3.3.3. ROPE(S) DEPLOYED. Once the FE has determined that the rappel lines have deployed safely and approximately 20 feet of rope is on the ground, he gives the command ROPES DEPLOYED.

2.7.3.3.4. UNBUCKLE. On the clearance from the FE, the rope master directs rappellers to remove seat belts leaving their safety straps (unless already connected to a rappel line) attached until they are hooked into a rappel line. Once connected to a rappel line, the rappeller is authorized to remove the safety strap.

2.7.3.3.5. STAND-BY. The rope master individually directs each rappeller to the rope station and assists each rappeller to the "L" position (See **Figure 2.4.**) on the skid. If the rappeller is not afforded a belay, they should use a "prusik" for safety.

Figure 2.4. "L" Position.



2.7.3.3.6. GO. The rope master directs each rappeller to begin their descent.

2.7.3.3.7. RAPPELLER # ___ AWAY. The FE passes an advisory count of rappellers down the rappel line to the aircrew.

2.7.3.3.8. ROPE CLEAR. The FE advises the crew that no more rappellers are on the rappel line(s) and that the last rappeller is free and clear of the rappel line.

2.7.3.3.9. RELEASE/RETRIEVE THE ROPE. The AC directs that the rappel line either be released or pulled back inside the aircraft. (In an actual tactical situation, cut the rappel lines if time is critical.)

NOTE:

For multiple training evolutions, the rappel line may remain attached to the aircraft while the belayer walks the rappel line out to the 3- or 9-o'clock position as the aircraft makes a vertical descent.

2.7.3.3.10. CLEAR FOR FORWARD FLIGHT or CLEAR FOR LANDING. The FE confirms to the aircraft commander that the rappel line(s) are clear of the aircraft or obstacles and that there is no possibility that the rappel line(s) will become fouled. Once assured that all is

clear, the aircraft commander transitions the aircraft from a stable hover to forward flight or, during multiple training evolution's, lands.

2.7.4. Emergency Commands and Hand and Arm Signals. The following commands are not part of the normal rappelling sequence of events. They are used to either suspend or terminate helo-rappel operations whenever unsafe or questionable situations arise. (Commands are highlighted in bold capital letters.)

2.7.4.1. ABORT. Initiated by the AC in order to cease further rappel operations until an unsafe situation is corrected. The signal is a hand moving back and forth in front of the neck in a slashing motion.

2.7.4.2. CUT ROPE. Initiated by the AC as a last ditch effort to free a fouled rappel line. The signal is a hand with fingers extended and joined moving in a chopping motion against the opposite wrist.

2.7.4.3. HOLD. Initiated by any crewmember to include the rope master. Rappellers stand fast and await further instructions. The signal is a forearm raised vertically (as in taking an oath) with a clenched fist in front of the face.

2.7.4.4. STRAP IN. Initiated by any crew member to include the rope master, to direct rappellers remaining in the aircraft to return to their seats and don seat belts/safety straps. The signal is double clenched fists at the belt buckle.

2.7.4.5. LOST COMMUNICATIONS. ICS or air-to-ground communication has been lost. The signal is hands placed at the ears with palms open and forward.

2.7.4.6. ENTANGLEMENT. The rope or ropers are fouled on obstacles. The signal is forearms raised laterally to the front at shoulder height, clasping hands with palms facing and fingers interlocking.

2.7.4.7. AIRCRAFT EMERGENCY. An aircraft emergency presently exists. The signal is a hand with fingers extended and palm down is raised and lowered above the head.

2.7.4.8. CRASH LANDING. The aircraft is making a crash landing. The signal is both hands, each with fingers extended and palms down, raised and lowered above the head in unison.

2.7.5. Emergency Procedures. Many varied and unique situations can arise when rappelling personnel from a hovering aircraft. Aside from inherent dangers of rappelling, the rappel master and the rappellers must be prepared to address aircraft emergencies which could reasonably occur during helo-rappel operations. Multiple emergencies, adverse weather or other unusual conditions may require modifications to these procedures. The nature and severity of the emergency dictates the degree of compliance. As such, sound judgment is the critical element in corrective action.

2.7.6. Aircraft Emergency. If the helicopter experiences engine failure or other aircraft emergencies during operations, rappellers on the line descend as rapidly as possible and move from beneath the helicopter to the 6-o'clock position. In the event of an aircraft emergency, initiate the following procedures:

2.7.6.1. On command from the aircraft commander to ABORT, the rope master ensures rappellers already descending the rappel line are clear of the rappel line and the possible helicopter impact area.

2.7.6.2. The rope master directs rappellers still inside the aircraft to STRAP IN. Once seated and secured, all personnel then follow the directions of the FE.

2.7.7. Lost Communication/ICS Failure. Communication between the aircraft commander, FE and the rope master is mandatory. In the event of ICS failure, employ the following hand-and-arm signals to terminate operations:

2.7.7.1. ABORT (cease rappel line operations)--slashing motion of the right hand across the throat.

2.7.7.2. STRAP IN (double clenched fists at the belt buckle).

NOTE:

At no time are descents initiated during an ICS failure.

2.7.8. Hung Rappeller. This is a rappeller who has exited the aircraft and is unable to complete the descent to the ground. A rappeller can become hung for a variety of reasons--fouled rappel line, loose clothing, straps, equipment or a misplaced hand. In the event of a hung rappeller, initiate the following procedures:

2.7.8.1. The rope master or the FE immediately notifies the aircraft commander.

2.7.8.2. If possible, the aircraft will descend to lower the rappeller to the ground.

2.7.8.3. If the AC is unable to land the helicopter and must search for a landing site, the rope master lowers a safety line down the rappel line to the hung rappeller with a snaplink attached. The hung rappeller connects the safety line snaplink to their rappel seat snaplink. The safety line is secured to the inside of the aircraft at an anchor point other than the fouled rappel line's anchor points and is set up in a belay.

2.7.8.4. If the aircraft is unable to land and the hung rappeller is unable to attach the safety line, the rope master lowers the hung rappeller to the ground from inside the aircraft.

2.7.8.4.1. The aircraft commander is notified and the FE will assist.

2.7.8.4.2. The helicopter descends as low as possible.

2.7.8.4.3. Taking slack off the hung rappel line, disconnect the hung rappel line from all anchor points.

2.7.8.4.4. By releasing tension on the safety rope (belay), the rope master lowers the hung rappeller to the ground.

2.7.9. Fouled Rappel Line. A rappel line may become fouled or entangled on ground obstacles during rappel operations. If this happens, start the following procedures:

2.7.9.1. The rope master ensures all rappellers are clear.

2.7.9.2. If possible, the aircraft commander descends or repositions the aircraft in order to decrease tension on the rappel line.

2.7.9.3. The FE then removes the rappel line from the anchor points and releases it.

2.7.9.4. If sufficient tension cannot be released from the rappel line to facilitate release from the anchor points, the rope must be cut.

NOTE:

The FE must have a V-blade knife readily available throughout helo-rappel operations.

Chapter 3

FAST-ROPE PROCEDURES

3.1. General. Fast roping is a unique form of helicopter insertion. It is a means of descending from a helicopter by sliding down a heavily braided rope gripped between the hands, thighs and feet. As in rappelling, the individual (referred to hereafter as a roper) descending upon the rope applies friction on the rope to control their descent. Unlike rappelling, the roper does not use a mechanical friction device to control the descent. Rather, the roper applies necessary friction using hands, thighs and feet; these are brakes. The tighter the grip, the slower the descent, and vice versa.

3.2. Chapter. This chapter establishes the basic guidelines for employing fast rope and training individuals in fast rope techniques. These guidelines include procedures, rigging specifications and, above all, minimum safety standards.

3.3. Concept. Fast roping is suitable for most terrain including mountainous and heavily wooded areas. This technique is especially used in urban environments to rapidly descend onto buildings. Because fast roping does not involve a mechanical hookup between the roper and rope, the roper can exit the aircraft and assume a tactical role at a greater tempo than is possible through a rappel insert. This increased tempo facilitates inserting more ropers over a shorter period of time, thus minimizing the exposure of ropers and aircraft to the threat.

3.3.1. Since fast roping does not incorporate mechanical fasteners or friction devices, it is unsuitable for delivering equipment unless attached to a roper. Fast roping is solely a means of moving an individual from a hovering helicopter to terrain unsuitable for aircraft landing. The skills necessary to perform fast roping are far less tasking than those required for rappelling. The inherent simplicity and speed of fast rope operations constitute its greatest attributes.

3.4. Personnel. To ensure safe fast rope operations utilizing AFSPC personnel, a properly trained and certified rope master is imperative.

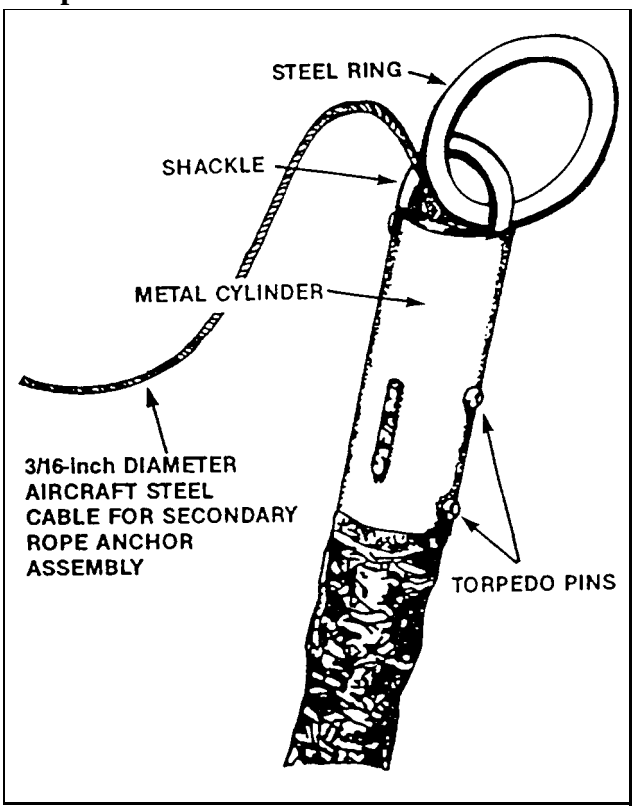
3.4.1. Fast Rope Master Re-qualification. A rope master must re-qualify every 18 months. The qualification expires on the last day of the 18th month following the previous qualification.

3.4.2. A rope master, showing a lack of proficiency, may be relieved by a rope master of senior grade, the FE or the AC. Any current rope master present for the evolution may assume the duties and responsibilities of the relieved rope master or may immediately terminate the evolution. If no rope master is present following relief, the FE will immediately terminate the evolution.

3.4.3. Duties. The rope master is responsible for administering a safety or operation brief and an aircrew brief, inspecting and rigging the aircraft and launching ropers.

3.5. Equipment. (**Figure 3.1.**) The fast rope consists of eight strands of multifilament polypropylene. Each strand is covered with multifilament polyester. The eight strands are braided into a 1 3/4-inch-diameter rope, having a tensile strength of 35,000 pounds. It is available in 60-, 90-, and 120 foot lengths.

Figure 3.1. Fast Rope End Cap.



3.5.1. The rope contains an end cap assembly on one end to facilitate fastening the rope to the hook-up point. The end cap consists of a metal cylinder which is drilled to accept torpedo pins, an end diaphragm which holds a shackle by means of a clevis bolt and a 3-inch steel ring held by the shackle. A hose clamp secures the end fibers of the fast rope. This clamp prevents the strands from separating and releasing the torpedo pins when placed under a load. The clamped rope end fits into the cylinder. Two torpedo pins pass through the cylinder and between the strands securing the rope to the end cap.

3.5.2. The rope master should inspect each fast rope before accepting it for use. Rope grading for the fast rope concerns visual appearance for serviceability, more so than the total number of descents.

3.5.2.1. To inspect the rope, lay it out at full length. Look for cuts, abrasions or other defects that, in the opinion of the rope master, would render the fast rope unserviceable.

3.5.2.2. To visually inspect a fast rope, first examine the end cap assembly and the swedged safety cable for sharp edges, loose screws, frayed cable or dented metal. Next, twist the rope at various intervals along its length. Look between the strands for small stones, dirt, etc.

3.5.3. Never stand, walk or step on a fast rope. This can force sand or dirt into the strands which causes fraying and weakens it.

3.5.3.1. If the fast rope becomes dirty, brush it lightly with a clean boot brush to remove particles. If necessary, rinse it with fresh water and lay it out to dry before storing.

3.5.3.2. Clean the metal sleeve and clevice ring of the end cap after each use, removing any rust.

3.5.3.3. If at all possible, keep the fast rope dry. If the fast rope becomes wet, dry it as soon as possible by uncoiling it and laying it in a dry, well-ventilated area. If possible, suspend it above the ground to reduce drying time. Never store a wet or damp fast rope.

3.5.3.4. If a fast rope comes into contact with salt water, rinse it thoroughly in fresh water before laying it out to dry.

3.5.3.5. Avoid excessive heat while drying. Do not lay fast ropes in direct sunlight when drying, as this weakens the synthetic fibers.

3.5.3.6. If a fast rope comes into contact with acids or petroleum-based solvents, it is immediately classified as unserviceable. Any fast rope considered unserviceable must be immediately tagged with the nature of the defect, the date and name of the inspector. These fast ropes should be disposed of by supply personnel.

3.5.3.7. Store the fast rope in an A-3 bag (or other suitable container) on a shelf when not in use. Do not store the rope on the ground.

3.6. Individual Equipment. At a minimum, each roper must have a pair of heavy leather gloves, hearing protection (during aircraft roping), eye protection and head protection.

3.6.1. Any uniform which fully covers the roper's arms and legs will suffice.

3.6.2. Heavy work-type leather gloves are worn during the descent. They must fully enclose the roper's fingers to ensure full protection.

3.6.3. Either a kevlar helmet, pro-tec(style helmet or flight helmet will be worn during descent.

3.6.4. Each participant must wear sound suppression devices. These may be either ear plugs, ear muffs or a flight helmet.

3.6.5. Each participant must wear protective eye wear. If the participant normally wears prescription eyeglasses, they may wear prescription safety glasses to fast rope. Generally, standard issue eye goggles fulfill the requirement. (Aircrew flight helmet visor will also suffice.)

3.6.6. Personnel working near rope stations must wear an aircraft gunner's belt, or be in a seat belt while the aircraft is airborne, until deploying on the fast rope.

3.6.7. An approved personal floatation device must be worn when the aircraft's route to the insertion zone passes over water.

3.7. Individual Procedures for Fast Rope. "The roper will grasp the rope with both hands (strong hand above weak hand) at eye level and in a deliberate move, step off the aircraft, bringing his feet and thighs together with the fast rope between them. The roper will not jump for the rope. Upon exiting the aircraft, the roper will turn 45 to 90 degrees so equipment does not contact the aircraft. While descending, the roper will keep hands at face level. The roper will adjust his rate of descent by either increasing or decreasing hand, thigh and foot pressure on the rope. The roper will not descend hand over hand. The rope should slide through the ropers gloved hands. The roper will not wrap feet and legs around the rope, but rather allow the rope to pass between the arches of his feet. If unsteady upon landing, the roper will immediately roll to the side, away from the rope to prevent injury from other descending ropers."

3.7.1. If your hands start feeling excessive heat from friction on the rope, apply more thigh and feet pressure. Do not let go of the rope.

3.8. Fast Rope Deployment. A fast rope that is knotted or fouled can increase the time it takes to insert. Coil the rope toe-to-head. To deploy the rope, merely drop the rope outside the aircraft. The fast rope simply uncoils and falls to the ground. Do not deploy the fast rope inside of it's container. Remove the fast rope from the container prior to take off.

3.8.1. Exercise caution when deploying fast ropes to avoid striking people on the ground.

3.9. Aircraft Rigging. The FE and the fast rope master are responsible for inspection of the aircraft and the fast rope system. The fast rope and safety cable is connected to the rescue hoist hook on the UH-1N. A full cable preflight of the hoist is not necessary for fast rope operations; however, the rest of the hoist preflight will be conducted by the FE.

3.9.1. All aircraft fast rope rigging employs one anchor point.

3.9.2. The fast rope, once coiled toe-to head, may be strapped down to the cabin floor using a seat belt or given to the first roper in the stick for security.

3.10. Restrictions. Only three ropers are authorized on the fast rope at any one time. At no time will the total load on any fast rope exceed 600 pounds. At least 10 feet of fast rope must be on the ground prior to the roper's deployment.

Fast Rope Procedures. Helicopter fast rope procedures follow a standard sequence of events for all types and models of aircraft. The UH-1N aircraft requires minor deviation from the norm, as indicated. The sequence of events follows a standard challenge and reply dialogue and transpires in three distinct phases: prior to takeoff, inflight and hover.

3.10.1. Following the operations brief, the aircrew brief and loading personnel aboard the aircraft, the rope master initiates the standard fast rope dialogue. (Commands are highlighted in bold capital letters.)

3.10.1.1. STRAP IN. Each roper sits laterally in a single file line front-to-back, facing the hoist with the first roper holding the fast rope in their lap. Each roper's safety strap/seat belt is fastened. The FE checks all seat belts and safety straps. All legs must be in the cabin during takeoff and landing.

3.10.1.2. CHECK EQUIPMENT. Each roper checks their equipment for loose or obstructive components.

3.10.1.3. SOUND OFF FOR EQUIPMENT CHECK. Each roper gives their status to the rope master as OK or states what is fouled with their equipment.

3.10.1.4. CLEAR FOR TAKEOFF. The rope master informs the FE when the ropers are ready for takeoff.

3.10.2. All fast rope participants remain strapped in and follow the directions of the FE.

3.10.2.1. At a minimum, 5- and 1-minute out calls will be given when the aircraft is approximately that far out from the drop zone. This gives the rope master time to prepare for the fast rope evolution.

3.10.2.2. GET READY - The rope master gives ropers a final warning to check themselves and ready equipment.

3.10.3. Once in a stable hover, the pilot on the controls gives ROPES, ROPES, ROPES which clears the rope to be deployed.

3.10.3.1. ROPE DEPLOYED. The FE passes this advisory to the pilot on the controls. The FE points out the open cargo door and yells ROPES once he verifies that at least 10 feet of rope is on the ground.

3.10.3.2. UNBUCKLE. On clearance from the FE, the rope master directs the ropers to remove seat belts/safety straps. The first roper will have physical control of the fast rope prior to removing their seat belt/safety strap.

3.10.3.2.1. .STAND BY. The roper grasps the fast rope at eye level and prepares to exit. The remaining ropers line up behind their stick leader staying off the rope until the rope master commands them to GO.

3.10.3.2.2. GO. The rope master directs each roper to begin the descent. The #1 roper, with hands already on the rope, moves forward and makes immediate rope contact with his/her thighs and feet. A downward descent is instantaneous. The rope master commands a subsequent roper to GO when the preceding roper descends approximately half the length of the rope. However, at no time will more than three ropers descend a rope at a time. The rope master may also deploy, only after all other ropers have deployed.

3.10.3.2.3. ROPER # ___ AWAY. The FE passes advisory calls to the pilot on the controls and counts the number of ropers descending.

3.10.3.2.4. ROPE CLEAR. The FE informs the pilot on the controls that no more ropers are on the rope and that the last roper is free and clear of the aircraft.

3.10.3.2.5. ROPE RELEASED/RETRIEVED. The FE passes advisory to the pilot on the controls that the rope is released or retrieved and secure.

3.10.3.2.6. For multiple training evolutions, the rope may remain attached to the aircraft while ground personnel walk the rope clear of the aircraft as it descends to the ground.

3.10.3.2.7. CLEARED FORWARD. The FE confirms to the pilot on the controls that the fast rope is clear of the aircraft or obstacles and there is no possibility the fast rope will become fouled. Once assured that all is clear, the pilot on the controls transitions the aircraft from a stable hover to forward flight or, during multiple training evolutions, lands.

3.10.3.2.8. During night operations, the FE should place chem-lights at the running end, 10 feet from the running end and at the fast rope attachment point. Each roper should have a chem-light attached to their person for easy identification.

3.11. Emergency Commands and Hand and Arm Signals. The following commands are not part of the normal fast rope sequence of events. They are used to either suspend or terminate fast rope operations whenever unsafe or questionable situations arise. A description of the appropriate hand and arm signals follows each explanation.

3.11.1. ABORT. Initiated by the pilot on the controls, in order to cease further fast rope operations until an unsafe situation is corrected. The signal is a hand moving back and forth in front of the neck in a slashing motion.

3.11.2. CUT ROPE. Initiated by the pilot on the controls or the FE as a last-ditch effort to free a fouled fast rope. The signal is a hand with fingers extended and joined moving in a chopping motion against the opposite wrist.

NOTE:

If the FE cannot release the fast rope by hand, shear the hoist cable.

3.11.3. HOLD. Initiated by any individual in the aircraft. The ropers stand fast and await further instructions. The signal is a forearm raised vertically (as in taking an oath) with a clenched fist in front of the face.

3.11.4. STRAP IN. Initiated by either the pilot on the controls, FE or the rope master directing ropers remaining in the aircraft to return to their seats and don their seat belts/safety straps. The signal is fists at waist height.

3.11.5. LOST COMMUNICATIONS. ICS or air-to-ground communication has been lost. The signal is hands placed at the ears with palms open and forward.

3.11.6. ENTANGLEMENT. The fast rope or ropers are fouled on obstacles. The signal is forearms raised laterally to the front at shoulder height, clasping hands with palms facing and fingers interlocking.

3.11.7. AIRCRAFT EMERGENCY. An aircraft emergency presently exists. The signal is a hand with fingers extended and palm down is raised and lowered above the head.

3.11.8. CRASH LANDING. The aircraft is making a crash landing. The signal is both hands, each with fingers extended and palms down, raised and lowered above the head in unison.

3.12. Emergency Procedures. Many varied and unique situations can arise from fast roping personnel from a hovering aircraft. Aside from the inherent dangers of fast roping, the rope master and ropers must be prepared to address aircraft emergencies. The following procedures address a few emergencies which could reasonably occur during helicopter fast rope operations. Multiple emergencies, adverse weather, or unusual conditions may require modifications to these procedures. The nature and severity of the emergency dictates the degree of compliance. As such, sound judgment is the critical element in corrective action. Declarative or directive statements mean actions by the FE and rope master.

3.12.1. If the helicopter experiences engine failure or other aircraft emergencies during fast rope operations, ropers on the fast rope must descend as rapidly as possible and move from beneath the helicopter to the 3-o'clock or 9-o'clock position (depending on which side the hoist is on). The pilot on the controls attempts to land the helicopter by moving forward. In the event of an aircraft emergency, initiate the following procedures.

3.12.1.1. Upon notification by the pilot on the controls of an emergency situation, signal the ropers still inside the aircraft to ABORT, STRAP IN and AIRCRAFT EMERGENCY if time permits.

3.12.1.2. Ensure ropers already descending the fast rope are clear of the rope and possible helicopter impact area. Signal ground personnel there is an AIRCRAFT EMERGENCY, if possible.

NOTE:

Once seated and secured, all personnel in the cabin follow the directions of the FE.

3.12.2. If the helicopter gains altitude so that the fast rope no longer touches the ground, or if the helicopter drifts off the target, initiate the following procedures:

3.12.2.1. Direct ropers to HOLD to prevent any additional descents.

3.12.2.2. Once back on target and/or altitude and on approval from the pilot on the controls, continue fast rope operations.

3.12.3. ICS communications between the pilot on the controls, the FE and the rope master is mandatory. In the event of an ICS failure, initiate the following procedures:

3.12.3.1. Signal the remaining ropers LOST COMMUNICATIONS and ABORT.

3.12.3.2. If ICS is re-established, the FE will direct the pilot on the controls back into position and operations may continue.

NOTE:

Hand-and-arm signals are only used to complete the descent of the ropers on the fast rope at the time of the ICS failure. At no time are descents initiated during an ICS failure.

3.12.4. A fast rope may become fouled or entangled on ground obstacles during the course of fast rope operations. If a fast rope becomes fouled, initiate the following procedures:

3.12.4.1. Immediately notify the pilot on the controls of the fouling and ensure all ropers are clear.

3.12.4.2. If possible, the pilot on the controls descends or repositions the aircraft in order to decrease tension on the fast rope.

3.12.4.3. Release the fast rope from the hoist hook and let it fall to the ground. If you cannot release the fast rope for tension on the rope, cut the hoist cable using the hoist cable cut switch. WARNING: Do Not Use The Helicopter To Pull The Rope Free.

3.13. Individual Roper Responsibilities. Training and safety equipment can only decrease, not eliminate, the inherent dangers or fast roping. Likewise, flight engineers and rope masters can neither foresee nor prevent every mishap. Whether descending the fast rope, moving about inside the aircraft, hooking up and belaying or weathering an aircraft emergency, fast rope safety depends largely upon the technical expertise and prudent judgment of the individual fast roper.

3.13.1. Understand and comply with all safety and emergency procedures and don and inspect all personal safety equipment for fit and serviceability.

3.13.2. Unbuckle seat belts/safety straps only on the command of the rope master or FE.

3.13.3. Maintain eye contact with the rope master during hookup and before beginning a descent and repet all commands (challenge and reply) from the rope master, including hand-and-arm signals.

3.13.4. Make only deliberate movements inside the helicopter and exit only on the command of the rope master.

3.13.5. Execute only controlled descents maintaining eye contact with the ground while descending.

3.13.6. Move rapidly away from the rope upon landing.

ROBERT C. HINSON, Brig Gen, USAF
Director of Operations

Attachment 1

SAMPLE HRST BRIEF TO AIRCREW

Figure A1.1. Brief to Aircrew.

1. Personnel Roll Call

a. HRST Master _____

b. Assistant HRST Master _____

c. # HRST Personnel _____

d. Aircraft Commander _____

e. Copilot _____

f. Flight Engineer _____

2. Operational Data

a. Takeoff Time _____

b. Insertion/Extraction Time _____

c. Location of Insertion/Extraction _____

d. Hover Altitude _____

e. # Insertion/Extractions _____

f. # Personnel Per Insertion/Extraction _____

2. Penetration/Approach Route

CHECK POINTS	LOCATION/ID	HEADING	DISTANCE	TIME
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____